

METHOD OF AND APPARATUS FOR MAKING BONDED BELT LOOPS

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BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a method of and apparatus for making bonded belt loops, and more particularly to a system for making bonded belt loops on a continuous basis.

In the manufacture of men's trousers and similar garments, belt loops have traditionally been fabricated by means of sewing. However, notwithstanding the long-term and widespread use of the sewing procedure for making belt loops, a number of problems relating to the manufacture of trousers and similar garments are known to originate with the use of the sewing procedure in making belt loops. For example, the sewing procedure is not readily adapted to automation. This means that in the manufacture of the total garment, the belt loop manufacturing phase introduces a number of time-consuming manual operations and therefore tends to add considerable cost to the manufacture of the garment. Moreover, although sewn belt loops are satisfactory in the traditional narrow widths, there is presently a trend towards the use of wide belt loops in the manufacture of men's trousers. It has been found that sewn belt loops having such widths tend to distort and wrinkle, and are otherwise generally unsatisfactory.

The present invention comprises a belt loop manufacturing system which overcomes the foregoing and other problems long since associated with the prior art. In accordance with the broader aspects of the invention, belt loops are fabricated by bonding a strip of belt loop material to a strip of interfacing material. The bonding procedure is carried out on a continuous basis, thereby eliminating the numerous manual operations which are required when belt loops are made by means of sewing. Moreover, belt loops of any desired width can be manufactured by means of the invention, and do not exhibit any tendency toward wrinkling or distortion even when fabricated to widths of 1 1/4 inches or greater.

In accordance with more specific aspects of the invention, a layer comprising a thermally activated adhesive material is provided on one side of a strip of interfacing material. The strip of interfacing material and a strip of belt loop material are transported along a predetermined path with the reverse side of the belt loop material engaging the side of the interfacing material opposite the adhesive layer. The strip of belt loop material is initially trimmed to a predetermined width and is then folded around the strip of interfacing material. The adhesive layer is then heated sufficiently to effect activation thereof. Simultaneously the folded edges of the strip of belt loop material are engaged with the activated adhesive layer, thereby permanently bonding the strip of belt loop material to the strip of interfacing material.

In accordance with still more specific aspects of the invention, the strip of interfacing material and the strip of belt loop material are transported along support structure and into engagement with a revolving bonding drum by an endless belt. The belt loop material is trimmed by means of a pair of opposed rotating knives located adjacent the path of the material and at the opposite end of the support structure from the bonding

drum. The knives each have a non-circular cross section and thereby assist the endless belt in transporting the strip of belt loop material along the initial portion of the path.

The folding apparatus is situated at a point in the support between the rotating knives and the rotating drum. The folding apparatus includes structure comprising an extension of the support structure which supports the strip of interfacing material, the mid-portion of the strip of belt loop material, and the endless belt. Groove structure is disposed between the support structure to receive the opposite edges of the strip of belt loop material and thereby serves to fold the edges of the strip of belt loop material under the strip of interfacing material.

The revolving bonding drum comprises an aluminum ring having a relatively large diameter peripheral surface and a heating ring disposed beneath the surface of the drum. Upon leaving the folding apparatus, the strip of belt loop material and the strip of interfacing material are pressed into engagement with the surface of the drum by the endless belt and are transported by the drum through substantially the complete revolution thereof. By this means the adhesive layer of the strip of interfacing material is activated and the folded edges of the strip of belt loop material are simultaneously engaged with the activated adhesive material, thereby permanently bonding the strip of belt loop material to the strip of interfacing material.

DESCRIPTION OF THE DRAWINGS

A more complete understanding of the invention may be had by referring to the following Detailed Description when taken in conjunction with the accompanying Drawings, wherein:

FIG. 1 is a somewhat diagrammatic illustration of a system for making bonded belt loops incorporating the invention;

FIG. 2 is an illustration of the trimming apparatus of the system shown in FIG. 1 in which certain parts have been broken away more clearly to illustrate certain features of the invention;

FIG. 3 is a sectional view taken generally along the line 3—3 in FIG. 1 and illustrating the folding apparatus of the system;

FIG. 4 is an exploded view illustrating the revolving bonding drum apparatus of the system; and

FIG. 5 is a sectional view illustrating a bonded belt loop made in accordance with the invention.

DETAILED DESCRIPTION

Referring now to the Drawings, and particularly to FIG. 1 thereof, there is shown a system for making bonded belt loops 10 incorporating the invention. In the use of the invention, strips of belt loop material 12 are sequentially fed into the system 10 by an operator who positions the strips 12 lengthwise on a support 14. Each strip 12 is then manually advanced into engagement with an endless belt 16 which functions to transport the strip throughout the remainder of the system 10.

A strip of interfacing material 18 is also received between the support 14 and the endless belt 16. The strip of interfacing material 18 passes upwardly from a supply reel 20 through a slot from the support 14 and under the strip of belt loop material 12. The strip of interfacing material 18 may comprise a stiffened open weave horsehair or cotton material of the type known